

【ABSTRACT】

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The present invention relates to a composition for slimming, and more
5 particularly, to a slimming composition containing theanine and at least one
selected from the group consisting of caffeine, genistein and L-carnitine. The
composition of the present invention contains theanine and at least one of
caffeine, genistein and L-carnitine, and has properties of decomposing fats,
hydrolyzing lipid and removing cellulites.

10

【REPRESENTATIVE FIGURE】

Fig. 1

【KEY WORD】

15 theanine * caffeine * genistein * L-carnitine * fat cell * decomposing fats
* neutral fat(triglyceride) * free fatty acid * glycerol * obesity * cellulite * diet

【SPECIFICATION】

【TITLE】

Composition for slimming

5 **【BRIEF DESCRIPTION OF DRAWINGS】**

Fig. 1 is a graph showing the result of an experiment for synergic effects of theanine and caffeine improving decomposition of fats.

Fig. 2 is a graph showing the result of an experiment for synergic effects of theanine, caffeine, genistein and L-carnitine improving decomposition of fats.

10 Fig. 3 is a graph showing the decreasing rate of subcutaneous fat by the skin external composition of the present invention.

Fig. 4 is a graph showing the decreasing rate of subcutaneous fat after using the skin external composition of the present invention containing theanine, caffeine, genistein and L-carnitine, and eating the food composition for dietary
15 food composition of the present invention containing theanine, caffeine, genistein and L-carnitine.

Fig. 5 is a graph showing the improvement of skin firmness after using the skin external composition of the present invention containing theanine, caffeine, genistein and L-carnitine, and eating the food composition for dietary food
20 composition of the present invention containing theanine, caffeine, genistein and L-carnitine, observed with the naked eye.

【DETAILED DESCRIPTION OF THE INVENTION】

【OBJECT OF THE INVENTION】

25 **【FIELD OF THE INVENTION AND BACKGROUND THEREOF】**

The present invention relates to a composition for slimming, and more particularly, to a slimming composition containing theanine and at least one selected from the group consisting of caffeine, genistein and L-carnitine. The composition of the present invention contains theanine and at least of caffeine,
5 genistein and L-carnitine, and has properties of decomposing fats, hydrolyzing lipid and removing cellulites.

A human body has about 20 billion fat cells, which store and release energy in the body. Complex mechanisms exist for storing and releasing energy
10 in a body, and when the amount of energy supplied is more than that consumed, the excess energy is stored as neutral fat (lipid) in the fat cells (adipocytes), and when energy is required the fats are hydrolyzed as free fatty acid and glucose to be used as energy. Obesity appears when the energy balance is broken in this mechanism and excessive energy is accumulated, and as a result, fat cells become
15 larger or the number of fat cells increases.

It is reported that about 30~40% of the recent generation have obesity, and because the obesity often accompanies geriatric diseases such as hypertension, hyperlipemia, arteriosclerosis, cardiac disorder, and diabetes, it is an important concern to treat obesity. In addition, not only for health but also for beauty,
20 treating obesity and maintaining preferable physical condition and body figure are great concerns for women, because women's desires for quality of life are increasing due to social environmental changes, such as a raising of social status, or economic independence. From a viewpoint of beauty, the desire for cosmetics for slimming and anti-cellulite, which is effective for removing excessive
25 subcutaneous fat and to improve firmness and elasticity of skin, also increases.

Cellulite is generated in the skin and subcutaneous fat, and makes the skin rough like a peel of an orange due to the accumulations of fat and waste materials therein. Even though obesity is not a direct cause of generation of cellulite, cellulite increases when the size or the number of fat cells increases, and
5 therefore decomposing and removing fats in fat cells is very effective in order to maintain preferable body figure and skin state.

Therefore, various methods for treating obesity have been studied from the viewpoints of health and beauty. Conventional methods for treating obesity comprise a diet cure, an exercise cure, a surgical cure and a drug cure in order to
10 reduce intake of energy or to increase consumption of energy. However, because these methods cannot solve the problem of obesity completely and may have severe side effects, effectiveness and safety are not yet guaranteed. In addition, from the viewpoint of beauty, because the treatment of obesity should consider the improvement of skin state as well as removing fats, the above methods are
15 not sufficient to be applied. Therefore it is required to find a new material having similar or better effects than those of the conventional materials without side effects.

In a prior patent application related to reducing obesity (Korean patent application No. 2003-0026015), it is disclosed that theanine, which is a flavour
20 component of green tea, accelerates decomposition of fat, being similar to caffeine known as a positive control of decomposing fat in the field of cosmetics, and that the mechanism of theanine is different from that of caffeine. However, the synergic effects of decomposing fat when theanine and caffeine are used simultaneously have not been disclosed. In addition, in a prior patent application
25 related to decomposing fat and inhibiting obesity when eating both genistein and

L-carnitine, as food, it is disclosed that the genistein and L-carnitine could prevent and inhibit obesity effectively with a different principle from theanine and caffeine, however, it is not disclosed whether the four materials could induce the synergic effect of decomposing fat effectively when each of the four materials is applied to the body by a different pathway.

【TECHNICAL PROBLEM TO BE SOLVED】

Considering the causes of obesity and the disease induced therefrom, an important aim is not just reducing body weight but reducing the body fat. Therefore, it is necessary to find a method for increasing the decomposition or combustion of unnecessary fats accumulated in the body.

The present inventors studied and researched to find a safe material that can improve decomposition or hydrolysis of fats and accelerate combustion of fats, and found that theanine, caffeine, genistein and L-carnitine have properties of hydrolyzing lipid and decomposing neutral fats in fat cells and can help enhancing the firmness and the elasticity of the skin.

As result of further study, the present inventors found that a skin application composition containing theanine and at least one of caffeine, genistein and L-carnitine, and a food composition containing theanine and at least one of caffeine, genistein and L-carnitine, have properties of decomposing fats, hydrolyzing lipid and removing cellulites, and that the compositions can help to maintain a preferable elastic and firm skin by accelerating decomposition of fats in fat cells and decreasing subcutaneous fats and cellulites.

Therefore, the present invention provides a novel use of theanine that can improve the decomposition of neutral fats and can accelerate the expression of

β_3 -adrenergic receptor to help the combustion of fats; a novel use of caffeine that can suppress the expression of phosphodiesterase, an enzyme that inhibits the decomposition of fats in a fat cell, to improve the decomposition of fats; a novel use of genistein that can accelerate the decomposition and combustion of
5 fats; a novel use of L-carnitine mixture that can accelerate the functions of genistein decomposing fats; and a novel use of catechin that can suppress the differentiation of fat cells (adipocytes).

The present invention also provides a skin external composition containing theanine and at least one of caffeine, genistein and L-carnitine, that
10 has properties of decreasing subcutaneous fats, reducing roughness on the skin induced by the cellulite, and recovering firmness and elasticity of the skin.

In addition, the present invention provides a diet food composition containing theanine and at least one of caffeine, genistein and L-carnitine, that has the properties of accelerating the decomposition of neutral fat accumulated
15 excessively in all fat cells of the body, and removing body fat.

【COMPOSITION OF THE INVENTION】

In order to accomplish the object of the invention, the composition for slimming of the present invention comprises theanine and at least one selected
20 from the group consisting of caffeine, genistein, L-carnitine and catechin, which enhances the metabolism of the fat cells to improve decomposition of fats.

In particular, the composition of the invention is characterized by applying to an internal and external part of the body simultaneously with the forms of diet food and skin external composition.

Hereinafter, the present invention is described in detail.

The term "slimming" means inhibiting and reducing obesity as well as reducing cellulite to make a preferable body figure and firm and elastic smooth skin.

5 Theanine is a kind of amino acid that exhibits the specific flavour of green tea, and it is reported that when a person takes theanine, α -ray increases, which makes a person relaxed and stabilized (Nippon Nogeikagaku Kaishi. 72(2), 153-157 (1998)). The theanine of the present invention comprises L-form, which is extracted from green tea, and L-theanine, D-theanine and DL-theanine that are
10 synthesized, and any form of the theanines can be used in the present invention.

Caffeine, known as a positive control of an enhancer for decomposition of fat, is a kind of methylxanthine material that shows a property of decomposing fat, which suppresses the expression of phosphodiesterase - an important material in the decomposition of fat - to increase cAMP in the cell (Astrup, A. et al., *Am J.*
15 *Clin. Nutr.* 51: 759, 1990).

Genistein is a kind of isoflavone generally contained in soybeans, and is a vegetable hormone similar to a female hormone having various physiological activities, and it is reported that the genistein has the properties of controlling metabolism of fat in an adipocyte (J. Steroid Biochem Mol Biol. 75(4-5): 265-71
20 (2000)), and reducing blood cholesterol (J. Nutr. Jan; 126(1): 43-50 (1996)).

L-carnitine is an essential nutrient that is synthesized in a liver or a kidney and is generally contained in food, especially in red meat. It is reported that when L-carnitine is insufficient, generation of energy decreases because concentration of fatty acid in a mitochondria decreases, and that L-carnitine has various
25 properties of anti-aging effects, reducing blood fat, and enhancing heart function

(Robert Crayhon, M.S., Carnitine miracle).

Methods for extracting effective components of the present invention are not limited, and any methods known in this field can be applied without limitation.

5

The composition of the present invention has properties of decomposing body fats and subcutaneous fats by applying in the forms of diet food and skin external composition. This is because the composition of the present invention helps to enhance the effects of decomposing fats and to maintain the effects
10 actively through different paths.

The composition of the present invention comprising theanine and at least one of caffeine, genistein and L-carnitine has excellent effects of decomposing neutral fats in fat cells. More specifically, the composition of the present invention accelerates decomposition of fats by hydrolyzing triglyceride in
15 adipocyte (fat cell) to a free fatty acid and a glycerol. This is because the composition of the present invention improves the expression of β_3 -adrenergic receptor in a 3T3-L1 cell differentiated to an adipocyte to enhance and maintain the hydrolysis of triglyceride and has a function to improve the expression of enzymes related to the decomposition or combustion of fats.

20 Therefore, when the composition of the present invention comprising theanine and at least one selected from the group consisting of caffeine, genistein and L-carnitine is applied to the skin, the composition can help to improve the body figure and make a more elastic, firm and smooth skin by selectively removing subcutaneous fats.

25 In addition, when the composition of the present invention comprising

theanine and at least one selected from the group consisting of caffeine, genistein and L-carnitine is administered in the form of food, it has excellent effects of decomposing fats in the whole body including in the internal organs and abdomen.

5 In addition to reducing fats, the composition of the present invention can be used for an external composition or health food for anti-cellulite curing rough skin to be elastic, firm and smooth by applying the composition onto a cellulite site generated due to the enlarged fat cells. In particular, because the components of the composition are extracted from green tea and soybean, there are not
10 undesirable side effects or harm to the skin.

 In addition to the effects of decomposing and removing fats excessively accumulated in a mature fat cell, the composition of the present invention helps combustion of free fatty acid to reduce and prevent obesity. Contrary to the conventional methods or compositions that are focused on only one feature, for
15 example on differentiation of fat cells or on acceleration of decomposition of fats, the composition of the present invention can decompose fats in fat cells already generated and can remove the by-products of the decomposition completely to prevent re-accumulation of fats, which provides a novel and direct method and composition for preventing obesity.

20 Any conventional method can be applied to mix the components of the present invention, theanine, caffeine, genistein and L-carnitine, and one skilled in the art may modify the methods easily. In addition, additives, for example to make the mixing easier, can be adopted without limitation.

 In the present invention, the total amount of theanine and at least one of
25 caffeine, genistein and L-carnitine is preferably 0.0001~20wt% to the total

weight of the composition, but is not limited thereto.

The external application of the present invention comprises theanine and at least one selected from the group consisting of caffeine, genistein and L-carnitine, therefore, when applied onto the skin, it can reduce subcutaneous fat making the body figure slim and has the effects of slimming the body, removing cellulite and firming the body figure by the decomposition of subcutaneous fat.

The health food for diet of the present invention comprises theanine and at least one selected from the group consisting of caffeine, genistein and L-carnitine, therefore, it has effects of treating obesity by reducing subcutaneous and abdominal fats.

The compositions, that is skin external composition containing theanine and at least one selected from the group consisting of caffeine, genistein and L-carnitine, and diet food composition containing theanine and at least one selected from the group consisting of caffeine, genistein and L-carnitine, help to synergically treat obesity to decompose subcutaneous fats through skin as well as to reduce the whole body fats including fats of internal organs and the abdomen, and have excellent effects of slimming the body, removing cellulitem and improving skin firmness.

The formulations for the external application of the present composition comprising theanine and at least one selected from the group consisting of caffeine, genistein and L-carnitine are not limited on the condition that the composition is used for decomposition and combustion of fats, and elasticity and firmness of skin. For example, the formulation may comprise skin softener, nutrition water, nutrition lotion, massage cream, nutrition cream, pack, gel, and

skin adhesive type formulations, in addition to lotion, ointment, gel, cream, patch, spray and the like. In the above skin application formulations, in addition to the effective components of theanine, caffeine, genistein and L-carnitine, any other conventional component may be selected and added by one skilled in the art. By
5 the addition of proper components, synergic effect can be accomplished.

The formulations for the diet health food of the present composition comprising theanine and at least one selected from the group consisting of caffeine, genistein and L-carnitine are not limited on the condition that the composition is used for decomposition and combustion of fats, and elasticity and
10 firmness of skin. For example, the formulation may comprises tablet, granule, drink, caramel, bar and the like.

In the above skin external application formulations, in addition to the effective components of theanine, caffeine, genistein and L-carnitine, any other conventional components may be selected and added by one skilled in the art. By
15 the addition of proper components, synergic effect can be accomplished.

Hereinafter, the present invention is described in more detail with Examples and Experimental Examples, however the scope of the invention is not limited thereto.

20

<Reference Example 1> Isolation of fat cell (adipocyte) and method for measuring decomposition of fat

Epididymal adipose tissues obtained from male SD rat were cut to small pieces, and 0.1% of collagenase (in DMEM without phenol red) was added then
25 cultured for 2 hours at 37°C, and then filtered to obtain adipocyte (fat cell).

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Then, in order to verify the ability of each component to accelerate the decomposition of neutral fat in adipocytes of male SD rat, an experiment was performed using the adipocytes obtained above. 1×10^6 cells/well were cultured in DMEM (Dulbecco's modified eagles medium) containing 0.5% of bovine serum albumin (BSA) free from fatty acid for 2 hours and used in each experiment. Measurement of the quantity of the glycerol was performed with the chromphoric reaction method using a GPO-trinder kit from Sigma (St. Louis, MO, U.S.A.), and absorption was measured at 540nm using an ELISA reader, then the result of each component was calculated based on the data of a control being set as 100%. The control was cultured without experimental or comparative material, whereas $10 \mu\text{M}$ of each effective component theanine, caffeine, genistein, L-carnitine and catechin were added to the samples. The degree of the decomposition of fat was observed by measuring the concentration of glycerol isolated into the culture medium from fat cell.

15

<Experimental Example 1> Synergic effect of theanine and caffeine decomposing fats

In order to show synergic effects in the decomposition of fats in fat cells, the effect of decomposing fats, when treated with at least one of theanine and caffeine, was verified by the method of Reference Example 1. When treated with only one of theanine and caffeine at a concentration of $10 \mu\text{M}$, hardly any effects of decomposing fats resulted. The results are shown in Fig. 1.

As can be seen in Fig. 1, when theanine and caffeine are treated together the concentration of isolated glycerol to culture medium increased remarkably compared with the control.

25

<Experimental Example 2> Synergic effect of theanine, caffeine, genistein and L-carnitine decomposing fats

In order to verify whether theanine, caffeine, genistein and L-carnitine,
5 each having a different mechanism in the decomposition of fats, show synergic effects in the decomposition of fats, fat cells of SD rat isolated by the method of Reference Example 1 were treated with each of, and a mixture of, the above materials. The concentration of each of theanine, caffeine, genistein and L-carnitine was 40 μ M when treated alone, and when treated together the
10 concentration of each component was 10 μ M considering concentration balance. The results are shown in Fig. 2.

As can be seen in Fig. 2, when the four components are treated together the amount of isolated glycerol increases significantly compared with that when treated alone. Considering the decomposition results of fat in the Experimental
15 Examples 1~2, based on the prior patent applications KR 2003-0026015 and KR 2003-0018559, the increase obtained in Fig. 2 is not merely because of increase of the amount of effective components but because of synergic effects by the mutual operations of each mechanism of the components.

20 <Experimental Example 3> Measurement of skin irritation of theanine, caffeine, genistein and L-carnitine

Skin irritations caused by theanine, caffeine, genistein and L-carnitine were measured observing edema and erythema on the skin of a New Zealand white rabbit.

25 A vehicle, and 10% of theanine, caffeine, genistein, L-carnitine and a

mixture thereof were applied on the skin of a New Zealand white rabbit, twice a day for 4 days, total 8 times. After application, a total skin irritation index was calculated by summing up the scores of erythema and edema. The index of skin irritation was measured according to Table 1, and the results are shown in Table 2.

- 5 The skin irritation index was calculated according to Draize's skin Primary Irritation Index (P.I.I.) (Draize, J.H., Appraisal of the safety of chemical in foods, drugs and cosmetics).

【Table 1】

Degree of skin irritation		score
Erythema and Crab	No erythema	0
	Very weak erythema (slightly observable by the naked eye)	1
	Clear erythema	2
	Severe erythema	3
	Dark red strong erythema and generation of crab	4
Edema	No edema	0
	Very weak edema (slightly observable by the naked eye)	1
	Clear edema (distinguishable)	2
	Severe edema (swollen about 1mm)	3
	Strong edema (swollen more than 1mm and extended outwards)	4
(Note) Primary Irritation Index =(mean sum of score of erythema and score of edema)/4		

10

【Table 2】

Component .	Primary Irritation Index (0~4)
Vehicle	0.6
10% Solution of theanine	0.8
10% Solution of caffeine	0.7
10% Solution of genistein	0.8
10% Solution of L-carnitine	0.7
10% Solution of theanine, caffeine, genistein, L-carnitine	0.9

As can be seen in Table 2, theanine, caffeine, genistein and L-carnitine do

[Examples 1~7 and Comparative Examples 1~2]

5 Table 3, which shows Examples 1~7 and Comparative Examples 1~2.

[illegible]

<Experimental Example 4> Slimming effect of skin external composition

In order to verify the slimming effects of the compositions prepared in Examples 1~7 and Comparative Examples 1~2, 90 adult females (10 females in 9 groups) of 20~30 years old having no problems in metabolism and whose BMI [Body Mass Index, $(\text{weight}(\text{kg})/\text{height}(\text{m}))^2$] ranged from 23 to 25 were selected. Then the lotion compositions prepared in Examples 1~7 and Comparative Examples 1~2 were applied to each group for 8 weeks twice a day on the inner part of thighs with massaging. Thicknesses of the subcutaneous fats were measured before and after 8 weeks of using the lotion to verify the effects.

Measurement of the thickness of the subcutaneous fat was performed using Ultrasound-EuB 415 US scanner with ultrasonic waves (unit: mm), data was treated by a method of Student t test as a positive verification, and the results before and after using the compositions were compared analyzing statistic significance (significance $p < 0.05$). The results are shown in Fig. 3.

As can be seen in Fig. 3, Examples 1~7 comprising effective components showed more significant effects of decreasing the thickness of subcutaneous fat than Comparative Example 1 not containing an effective component, and Comparative Example 2 containing only theanine. In particular, Example 1 containing all of the 4 effective components showed the most significant effect.

20

[Examples 8~10 and Comparative Examples 3~4]

Health foods for diet were prepared according to the following Table 4, which shows Examples 8~10 and Comparative Examples 3~4, by mixing materials weighed, making granules with fluidized dryer, and tableting with a tableting machine.

25

【Table 4】

Component	Example (wt%)			Comparative Example (wt%)	
	8	9	10	3	4
Dietary fiber	50.0	50.0	50.0	50.0	50.0
Theanine	0.6	0.6	0.6	-	0.6
Genistein	0.4	0.4	-	-	-
L-carnitine	1.3	-	1.3	-	-
Maltitol	36.7	38.0	37.1	39.0	38.4
Lactose	10.0	10.0	10.0	10.0	10.0
Magnesium stearate	1.0	1.0	1.0	1.0	1.0

<Experimental Example 5> Slimming effect of diet health food

- 5 In order to verify the slimming effects of the foods prepared in Examples 8~10 and Comparative Examples 3~4, 50 adult females (10 females in 5 groups) of 20~30 years old having no problems in metabolism and whose BMI [Body Mass Index, $(\text{weight}(\text{kg})/\text{height}(\text{m}))^2$] is ranged from 23 to 25 were selected. Then the foods prepared in the Examples 8~10 and Comparative Examples 3~4
- 10 were administered to each groups 2 tablets (2g/tablet) before a meal 3 times a day for 8 weeks. The results are shown in Table 5, and Table 5 shows mean and standard deviation of general indexes of obesity, i.e., body weight, body fat weight, body fat percentage, waist hip ratio and BMI, measured with body composition analyzer (InBody 4.0, Biospace Co., LTD, Korea) before and after
- 15 the clinical trial for 8 weeks .

【Table 5】

	Example 8 (10 people)		Example 9 (10 people)		Example 10 (10 people)		Comparative Example 3 (10 people)		Comparative Example 4 (10 people)	
	Befor	After	Befor	After	Befor	After	Befor	After	Befor	After

	e		e		e		e		e	
Body weight (kg)	58.8±4.5	56.3±3.1**	69.1±1.7	66.9±3.9*	68.5±2.1	67.0±3.4*	59.3±5.4	58.8±7.6	58.7±4.3	57.5±3.4*
BMI	24.3±2.2	22.3±2.7**	24.8±1.2	22.9±2.0*	24.1±1.2	23.0±1.9*	24.5±2.1	24.3±1.7	24.1±2.5	23.3±2.3*
Body fat weight (kg)	18.2±1.9	15.5±1.9**	18.4±2.5	17.3±1.3*	17.9±2.1	17.2±2.5*	18.0±2.4	17.9±3.3	18.0±2.1	17.5±3.1*
Body fat percentage (%)	30.6±4.2	27.4±3.2**	30.7±2.1	28.0±2.5*	30.3±1.1	28.4±3.2*	30.4±4.8	30.5±3.5	30.6±4.2	29.0±2.8*
WHR	0.82±0.03	0.08±0.03*	0.84±0.02	0.80±0.03*	0.83±0.05	0.80±0.03*	0.84±0.03	0.83±0.02	0.82±0.03	0.81±0.01*
* p<0.05, ** p<0.01 BMI : Body Mass Index = Body weight (kg) / height (m ²) WHR : Waist Hip Ratio										

As can be seen in Table 5, the cases of taking diet health foods of Examples 8~10 containing effective components of the present invention showed more significant effects of decreasing all obesity indexes than Comparative Examples 3~4. In particular, Example 8 that is the diet health food containing all of theanine, genistein and L-carnitine showed the most significant effect.

<Experimental Example 6> Slimming effect of skin external application and diet health food

In order to verify the slimming effect of the skin external application and the diet health food containing effective components, 80 adult females (20 females in 4 groups) of 20~30 years old having no problems in metabolism and whose BMI [Body Mass Index, (weight(kg)/height(m))²] ranged from 23 to 25 were selected, and a clinical trial was performed. After testees were divided into 4 groups in Table 6, the compositions prepared in Examples 1 and 8, and Comparative Examples 1 and 3 were administered and applied to the skin at the

same time.

The diet health foods were administered to each group as 2 tablets (2g/tablet) before a meal 3 times a day for 8 weeks, and the slimming lotions were applied to each group for 8 weeks twice a day on the abdomen, forearms, inner part of thighs, and hips with massaging. The effects were measured with body composition analyzer before treatment and after 8 weeks, and the results are shown in Table 7.

Table 7 shows mean and standard deviation of general indexes of obesity, i.e., body weight, body fat weight, body fat percentage, waist hip ratio and BMI, measured with body composition analyzer (InBody 4.0, Biospace Co., LTD, Korea) before and after the clinical trial for 8 weeks .

【Table 6】

	Comparative Example 1	Example 1
Comparative Example 3	Group A	Group B
Example 8	Group C	Group D

【Table 7】

	Group A (20 people)		Group B (20 people)		Group C (20 people)		Group D (20 people)	
	Before	After	Before	After	Before	After	Before	After
Body weight (kg)	59.3± 5.4	58.8± 7.6	59.5± 4.9	58.7± 5.5*	58.7± 4.3	56.5± 3.4**	59.2± 2.3	56.3± 3.1**
BMI	24.5± 2.1	24.3± 1.7	24.7± 3.3	23.9± 2.3*	24.1± 2.5	22.1± 2.9**	24.6± 1.7	21.8± 2.8**
Body fat weight (kg)	18.0± 2.4	17.9± 3.3	18.3± 3.8	17.7± 3.3	18.0± 2.1	15.5± 2.1**	18.1± 3.3	15.2± 3.8**
Body fat percentage (%)	30.4± 4.8	30.5± 3.5	30.8± 4.2	30.2± 3.5	30.6± 4.2	27.4± 3.2**	30.6± 3.6	26.9± 2.4**
WHR	0.84± 0.03	0.83± 0.02	0.84± 0.04	0.82± 0.02*	0.82± 0.03	0.80± 0.03**	0.83± 0.01	0.79± 0.03*
* p<0.05, ** p<0.01 BMI : Body Mass Index = Body weight (kg) / height (m ²) WHR : Waist Hip Ratio								

As can be seen in Table 7, in the case of body weight, all groups show

that weight decreased significantly, compared with before the clinical trial. In particular, Group C and Group D treated with Example 8 containing effective components show more significant effects of decreasing body weight and other indexes than that of Group A and Group B treated with Comparative Example 3,
5 and Group B and Group D treated with Example 1 containing effective components of the present invention show that the body fats selectively tend to decrease further, compared with Group A and Group C, respectively, taking the same diet food.

In addition, Group D treated simultaneously with Example 1 and
10 Example 8, which are skin external application and diet food, respectively, containing effective components of the present invention, show more significant effects of decreasing body weight and body fat. The composition comprising theanine, caffeine, genistein and L-carnitine has direct effects on decreasing body fats including abdominal fats and subcutaneous fats, and has synergic effects of
15 decomposing body fats, when simultaneously applied as food and external application.

<Experimental Example 7> Effect against cellulite of skin external application and diet health food

20 In order to verify the effects on skin and cellulite of the effective components of the present invention, besides indexes of obesity, evaluation of cellulite was performed by machine measurement of the thickness of the subcutaneous fat and permeated cellulite using Ultrasound-EuB 415 US scanner with ultrasonic waves (unit: mm). Resulting data was treated by a method of
25 Student t test as a positive verification, and the results before and after using the

compositions were compared analyzing statistic significance (significance $p < 0.05$). The results are shown in Fig. 4.

As can be seen in Fig. 4, after 8 weeks using the compositions, reduction of the thickness of the subcutaneous fat was observed significantly in Groups B, C and D, compared with Group A using Comparative Example 1 and Comparative Example 3. In particular, excellent effects for improving cellulite were observed in Group D using Example 1 and Example 8.

<Experimental Example 8> Firming effect of the skin external application and diet health food

In order to verify the firming effects of the compositions of the present invention, skin firmness was observed with naked eyes. The skin firmness was scored by an examiner from 1 to 9, and the scores before and after using the compositions were compared by analyzing statistic significance with Wilcoxon test (significance $\alpha = 0.05$) as a positive verification. The results are shown in Fig. 5.

As can be seen in Fig. 5, Groups B and D using Example 1, the skin external application containing the effective components of the present invention, showed the increased skin firmness.

As shown in the above, the skin external composition of the present invention containing theanine, caffeine, genistein and L-carnitine has effects on decomposing subcutaneous fat, reducing cellulite of women, and making skin firmer, and the diet food containing theanine, caffeine, genistein and L-carnitine has effects on reducing the body fat.

<Experimental Example 9>

Skin safety of the composition was evaluated by observing irritation and side effects on the skin of the human body, as evaluated by a dermatologist for the experiment period. The evaluation was carried out by the method of Experimental Example 3, and the evaluation standard was that shown in Table 1. The results are shown in Table 8.

【Table 8】

	Skin Primary Irritation Index (0~4)
vehicle	0.6
10% solution of theanine	0.8
10% solution of caffeine	0.7
10% solution of genistein	0.8
10% solution of L-carnitine	0.7
10% solution of theanine, caffeine , genistein and L-carnitine	0.9

As can be seen in Table 8, the components of the present invention have little skin irritation, compared to the control.

【EFFECT OF THE INVENTION】

As shown in the above, the slimming composition of the present invention comprising theanine, caffeine, genistein, L-carnitine and catechin has excellent effects of decomposing neutral fats in fat cells, and accelerates decomposition of fats by hydrolyzing triglyceride in adipocyte (fat cell) into free fatty acid and glycerol, and can thereby prohibit obesity and reduce subcutaneous fat cellulite to make a firmer and smoother skin and body figure. Therefore, the composition of the present invention can be applied to diet food and cosmetic compositions

for slimming and anti-cellulite, and can develop the food and cosmetic industry.

【CLAIMS】

1. A composition for slimming comprising theanine and at least one selected from the group consisting of genistein and L-carnitine as effective components,
5 that accelerates decomposition of neutral fats in fat cells.

2. The composition according to Claim 1, wherein said composition is one of a skin external application and a diet food.

10 3. The composition according to Claim 1, wherein said composition further comprises caffeine.

4. The composition according to Claim 1, wherein said theanine is at least one selected from the group consisting of L-theanine, D-theanine and
15 DL-theanine.

5. The composition according to Claim 1, wherein the components are contained in a total amount of 0.0001 ~20 wt% to the total amount of the composition.

20

6. A composition set for slimming comprising:

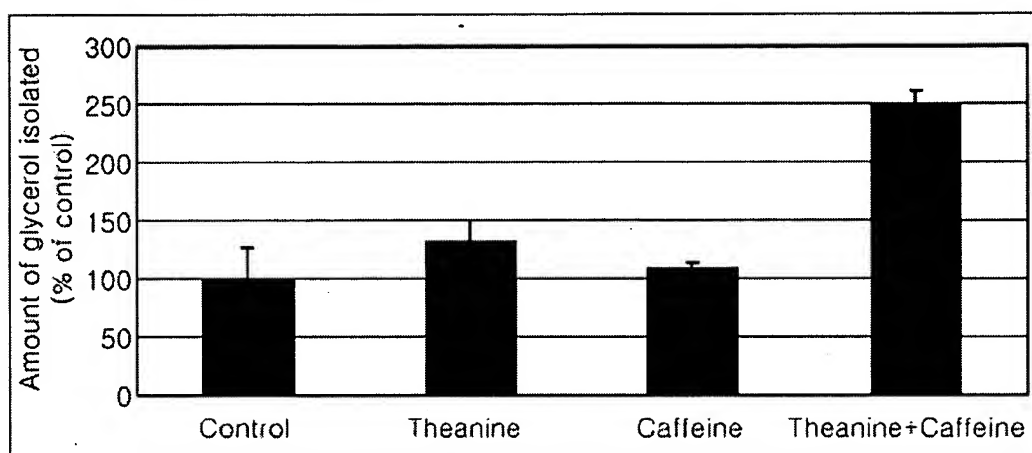
a skin external application composition containing theanine and at least one selected from the group consisting of caffeine, genistein and L-carnitine as effective components; and

25 a diet food composition containing theanine and at least one selected from

the group consisting of genistein and L-carnitine as effective components.

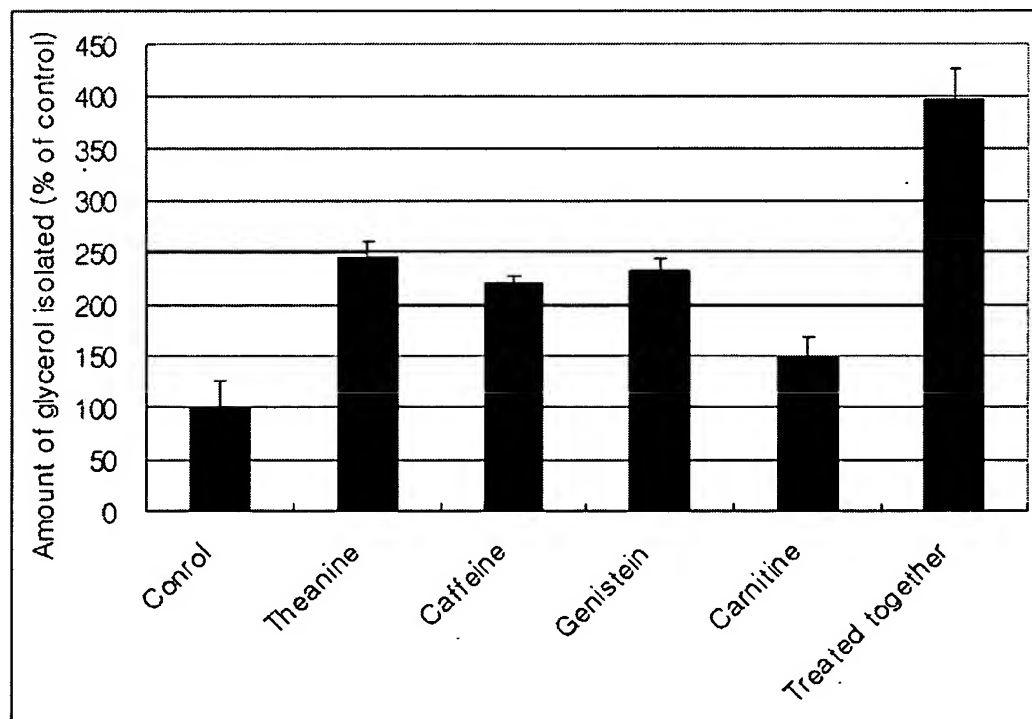
【FIGURE】

【FIG. 1】

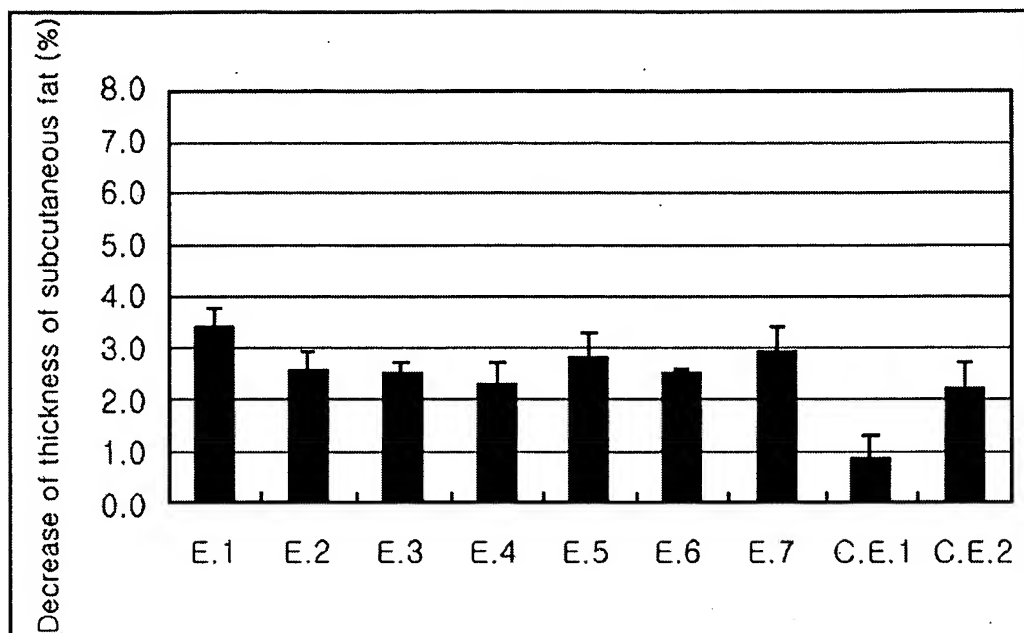


5

【FIG. 2】



【FIG. 3】

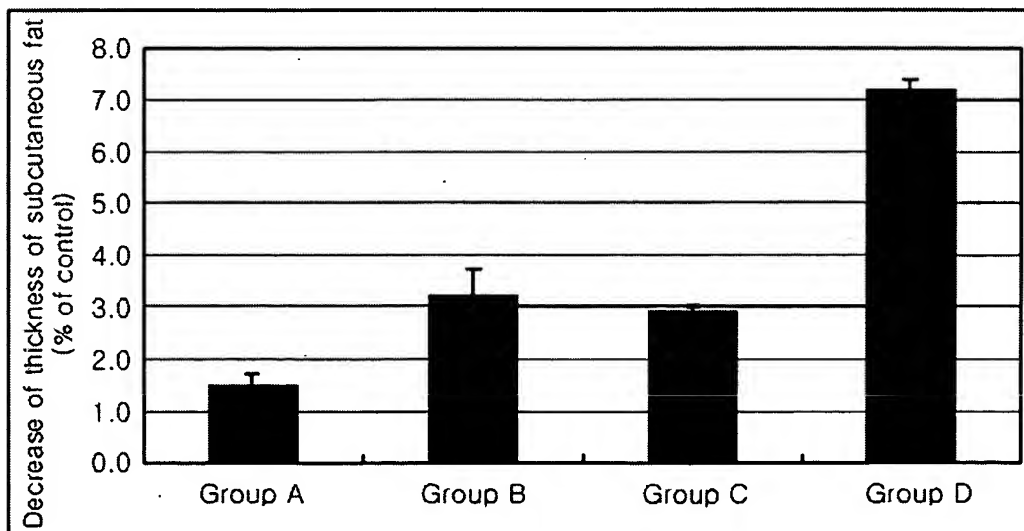


C.E.: Comparative Example

E. : Example

5

【FIG. 4】



【FIG. 5】

